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EDITORIAL.

Experiments on Coconuts.

An article in this number gives details of an experiment on the early manuring of young coconuts on heavy coastal clay in the Bagan Datoh District of Lower Perak and a combined manuring and cultivation experiment on young mature coconuts on heavy coastal clay in Province Wellesley South. The soils may be described as typical of much of the coconut area on the west coast of Malaya, and the results, therefore, may be expected to apply over an extensive area in this part of the country.

In the first of these experiments the effect of half-annual applications of a series of artificial fertilizers was observed on an area of young palms, which at the commencement of the experiment were about 20 months old. The palms came into bearing at five years and three months and yield records were taken for the first five years of bearing.

Results to date have shown that early manuring on this type of coastal clay has had no significant effect on the nut yield up to the end of the tenth year from planting out. It is possible, however, that differences may yet emerge; also that there may be differences between numbers of nuts per picul of copra and yields of copra for the various treatments.

The second of these experiments deals with the effect of covers and artificial manures. Here again the results to date are negative. In this experiment a subsidiary factor arose, namely drainage, as there was evidence that the palms were suffering from lack of water. An attempt was made to raise the water table by blocking drains and there is a certain amount of evidence that this measure was successful in increasing the yield of nuts.

The need for caution before embarking on any comprehensive scheme of manuring or cultivation of coconuts needs no emphasis at the present time when the low price of copra necessitates the strictest economy on the estate. The results of these experiments show, as have so many experiments in the past, that there is but limited scope for successful special methods of cultivation or manuring of coconuts, except under certain soil conditions which do not exist over large areas. We have for long held the opinion that the use of manures on the typical heavy coconut soils is not economical; the results of these and other experiments published recently in no way induce us to alter this view.

Marketing Pineapples. The Malayan pineapple industry has been very severely hit by war conditions; sales to the United Kingdom have been on a very restricted scale, while Canada, our second best customer, has also reduced imports.

Pineapple growers are particularly affected by the reduced market, and much of their fruit has become unsaleable and has been left to rot in the field. Naturally, packers are not indifferent to the present state of affairs, for an idle factory disorganizes routine and means financial loss to the owner.

As will be seen by perusal of the quarterly reports on the Malayan pineapple canning industry, which are a regular feature of this Journal, very promising results have been obtained from investigations in the preparation of pineapple products, in particular in the production of jam and juice. These products may now be said to be passing from the experimental stage, and while it cannot be expected that they will fully fill the gap caused by the loss of trade in canned pineapple, they are a decided step in the right direction and are of particular value in that they are not a war-time expedient to use up excess production of pineapples, but should prove to be a permanent asset to the industry.

The Rubber Producing Industry. In this issue we present our annual review for the rubber producing industry in Malaya. The subject perhaps needs little in the way of editorial introduction, for most of our readers have at least a fair idea of the political and other factors which have influenced the industry during the past year. In these days situations change with kaleidoscopic suddenness, however, and the record which we present of the progress of the industry during 1940 will be of value to the practical planters and to those in whose hands the destiny of the industry chiefly rests.

Original Articles.

RESULTS OF MANURIAL AND CULTIVATION EXPERIMENTS ON COCONUTS

BY
R. G. H. WILSHAW,
Senior Chemist (Soils).

The present article records the results to date of two experiments carried out with coconuts. In the first of these the effect of early manuring of the young palm on the subsequent yield of nuts has been tested; the second deals with combined manurial and cultivation treatments for young mature palms.

A. Early Manuring of Young Palms.

This experiment, which was suggested by the Advisory Committee of the Department of Agriculture, was commenced in 1932 on Estate E in the series of estates on which manurial experiments with this crop were at that time being conducted.(1).

The lines on which this particular experiment was laid out are as follows:

Locality. Estate E. Bagan Datoh, Lower Perak.

Area. About 6 acres.

Soil. Heavy coastal clay.

Date of Planting. November 1929.

Distance of Planting. 30 ft. x 30 ft. square, 48 palms per acre.

Lay-out. Randomized blocks. Five treatments replicated six times. Ten palms per plot.

Manurial Treatments.

Manurial applications commenced in August 1932, $2\frac{3}{4}$ years after planting. The rates of the initial dressings were as follows:

Treatment	Details	lbs. per palm
A	Control	nil
B	Calcium cyanamide	$\frac{1}{2}$
C	Basic slag	1
D	Calcium cyanamide	$\frac{1}{2}$
	Basic slag	1
E	Calcium cyanamide	$\frac{1}{2}$
	Basic slag	1
	Sulphate of potash	$\frac{1}{2}$

The above manures were applied half-yearly from August 1932 to February 1934, after which manuring was suspended until February 1936 when dressings at four times the above rates were applied and rock phosphate dust was substituted for basic slag, details being as follows:

Treatment	Details	lbs. per palm
A	Control	nil
B	Calcium cyanamide	2
C	Rock phosphate dust	4
D	Calcium cyanamide	2
	Rock phosphate dust	4
E	Calcium cyanamide	2
	Rock phosphate dust	4
	Sulphate of potash	2

No manuring has been carried out since February 1936.

There was a heavy cover of *Centrosema pubescens* and grass on the land, but the palms were ring-weeded to a radius of about 6 ft. and manures broadcasted on the cleaned areas.

Records.

Measurements of height and spread of the palms were taken at half-yearly intervals until 1934. Average figures for the different treatments on the occasion of the initial (23rd August 1932) and final (24th February 1934) measurement are given in Table I.

Table I.

Mean Height and Spread of Palms.

Treatment	23rd August 1932 2¾ Years after Planting		24th February 1934 4¼ Years after Planting		Increase in Mean after 1½ Years	
	Height	Spread	Height	Spread	Height	Spread
	ft.	ft.	ft.	ft.	ft.	ft.
A ...	17	17	26	24	9	7
B ...	16	17	25	25	9	8
C ...	16	17	25	23	9	6
D ...	16	17	25	24	9	7
E ...	16	17	26	25	10	8

Harvesting commenced in February 1935, five years and three months after planting. Records of good and bad nuts for each plot for six-monthly periods were kept. Table II shows the annual figures for good nuts for the period 1935 to 1939.

Table II.

Mean Numbers of Good Nuts per Palm per Annum from Individual Treatments.

Year	Treatment				
	A	B	C	D	E
1935 ...	12.3	10.6	10.0	15.3	11.5
1936 ...	14.9	13.7	14.5	17.7	17.2
1937 ...	20.7	19.8	19.6	24.1	21.2
1938 ...	28.0	29.6	25.6	30.9	28.5
1939 ...	44.1	48.6	43.6	51.0	49.8

Discussion of Results.

Individual plot yields of good nuts are not published, since statistical examination of these show no significant differences between treatments at any period.

The greatest differences in yields are shown by the 1939 figures for which the minimum significant difference between treatments would be 9.6 nuts per palm. The coefficient of variation of the experiment in 1939 was 18.8 per cent.

The conclusion to be drawn from this experiment to-date, therefore, is that early manuring on this type of coastal clay has had no significant effect on the nut yields at the end of the tenth year from planting out.

There is a suggestion in the results for 1939 that differences may emerge and it is proposed to record yields again in 1942 to test this point, also to commence collecting information on the differences between numbers of nuts per picul* of copra and yields of copra for the various treatments.

B. Combined Manuring and Cultivation of Young Mature Palms.

In 1933 an experiment on the above lines was laid down on an area of young mature palms on Estate C in the series of estates referred to previously(1).

The experiment was carried out co-operatively between the estate, Imperial Chemical Industries (Malaya) Ltd., and this Department.

The following are the details of the experiment:

Locality. Estate C. Province Wellesley South.

Area. Approximately 18 to 20 acres in Fields 55A, 34, 49 and 27.

Soil. Heavy coastal clay.

Dates of Planting. Block I 1928, Block II 1926, Block III 1923, Block IV 1922.

* 1 picul = 133⅓ lbs.

Distance of Planting. 30 ft. x 30 ft. square, 48 palms per acre.

Lay-out. Four blocks. Each block consists of 15 plots. There are 16 palms per plot. The plots are arranged in 3 columns and 5 rows. Cultivation treatments in the columns, manurial treatments in the rows. Columns are divided by drainage channels, rows divided by guard palms.

Treatments.

The details of cultivation and manurial treatments are as follows:

(i) *Cultivation.*

Treatment	Details.
A	Cover remaining (*Centrosema pubescens*).
B	Cover ploughed in.
C	Clean-weeded.

(ii) *Manurial.*

Treatment	Details	Amount per acre cwts.
P	Rock phosphate dust	3
K	Kainit	2
PK	Rock phosphate dust	3
	Kainit	2
NPK	Sulphate of ammonia	3
	Rock phosphate dust	3
	Kainit	2

(iii) *Control.*

No cultivation and no manurial treatment.

The above treatments were first effected in September 1934, and subsequently in November 1935. In January 1937 the cultivation measures only were carried out.

Drainage.

Since there was certain evidence for the suggestion that the palms in the experimental and adjacent areas were suffering from lack of water, alterations were made in 1934 to the drainage system in an endeavour to raise the water-table generally.

In addition, the drains in Blocks I and IV were permanently blocked at a height of 3 ft., and towards the end of each rainy season this block was raised by another 18 ins., reverting to 3 ft. when the rains arrived again.

Determinations of the water-table height made by means of bore holes sunk at monthly intervals showed no effect from the raising of the block the extra 18 in. in Blocks I and IV; this is probably due to the fact that the soil though a coastal clay was of a permeable type.

Yields of Nuts.

Plot records of good and bad nuts for six-monthly periods were kept from November 1934 to December 1939.

In 1936 owing to the extreme irregularity of the plots in Block I, some of which were situated on the site of former labourers' lines and others in low-lying poor areas, it was decided to exclude these yield records from the experiment, the figures, however, still being recorded.

Table III shows the annual figures of good nuts per palm, excluding Block I.

Table III.

Mean Numbers of Good Nuts per Palm per annum from Blocks II, III and IV.

Year	Treatment							Control
	Cultivation			Manurial				
	A	B	C	P	K	PK	NPK	
1935	21.8	19.4	19.2	19.8	16.8	18.4	15.4	17.4
1936	25.0	20.0	19.3	20.3	18.6	19.8	17.1	18.3
1937	29.2	20.3	23.5	23.8	22.1	21.9	19.4	19.7
1938	39.3	31.7	39.0	34.4	31.2	35.0	30.2	30.1
1939	39.5	32.2	37.6	34.4	32.8	33.4	30.9	28.4

Discussion of Results.

Cultivation and Manurial Treatments. A statistical examination of the individual plot yields, excluding Block I, over the whole period of the experiment shows no significant differences between either cultural or manurial treatments; the 1939 figures analysed separately show no significant differences. The coefficient of variation of the experiment over the whole period was 26.5 per cent. and in 1939 was 22.4 per cent.

The only conclusion that can be drawn, therefore, is one in support and amplification of that deduced from the experiment on Estate E reported earlier in this article.

The effects of the various treatments on numbers of nuts per picul of copra or yields of copra were not considered. Next year it is proposed to commence the recording of figures on these lines.

Drainage. The effect of the drainage measures on yield of nuts cannot be assessed statistically. Yields generally from the area outside the experimental sites have risen, as have the yields from all the experimental plots, over the period of the

experiment. Though this rise may be due to a certain extent to the increase in the age of the palms there is evidence that the raising of the water-table has had a beneficial effect.

Table IV shows the figures for the annual yields of nuts per acre from the whole area for a period of 7 years and it will be seen that 3 years after the institution of measures to raise the water-table the yields rose suddenly and have since maintained themselves.

Table IV.

Annual Numbers of Nuts per Acre from Whole Area.

Year	Area acres.	Number of Nuts per acre.
1933/1934	545	821
1934/1935	597½	987
1935/1936	668½	1,180
1936/1937	756	1,023
1937/1938	804	1,533
1938/1939	804	1,569
1939/1940	804	1,818

Note: The year is reckoned from 1st October to 30th September.

Summary.

1. Two experiments involving manurial and cultivation treatments on young coconuts growing on heavy coastal clay are described.
2. Negative results were obtained in both cases.

Acknowledgment.

The writer wishes to express his thanks to the managers of the estates for permission to publish the results of the experiments.

Reference.

1. Experiments on the Manuring of Coconuts and Oil Palms. *Malayan Agricultural Journal*, Vol. XX, No. 3, March 1932, page 105.

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THE MALAYAN RUBBER PLANTING INDUSTRY IN 1940.

Compiled from Official and Other Records by the Economics Branch of the Department of Agriculture, S.S. and F.M.S.

Prices.

The Singapore price of No. 1 X. Ribbed Smoked Sheet ranged, during 1940, between 35 and 40 cents per lb. It opened the year at 37⅝ cents, and in January rose to 39 cents, but in the same month fell to 36⅝. In February a new peak of 39⅛ cents was reached, and the price remained high until the middle of March when it started to fall, April showing the lowest level (35⅜) of the year. In May 39¾ was recorded, the highest level of the year, followed by an immediate fall and a further rise in June to 39½ cents. Thereafter the price fluctuated between 36 and 38 cents until the middle of October when a further improvement took place, continuing until the middle of November when the price reached 39¼ cents, after which it eased slightly to close at 37¾.

Table I shows the average annual prices in Singapore, London and New York for the past four years.

Table I.

Prices of Rubber per lb.

(No. I. X. Ribbed Smoked Sheet.)

	1937	1938	1939	1940
Singapore (cents, Malayan) ...	32.09	24.39	31.00	37.55
London (pence, sterling) ...	9.42	7.29	8.97	12.03
New York (cents, gold) ...	16.30	14.56	17.45	19.89

Areas.

Table II shows the total planted area of rubber in Malaya at the end of 1940 and its distribution. The total area was estimated to be 3,480,989 acres.

Budgrafted Areas on Estates.

Statistics of budgrafted areas on estates for the past three years are given in Table III.

At the end of 1940 180,229 acres of the total area of budded rubber (356,552 acres) had reached the tappable stage, while 151,618 acres were actually in tapping, compared with 123,382 acres of budded rubber in tapping at the end of 1939.

Table II.

Area under Rubber in Malaya as at end of 1940.

(in acres)

Territory	Estates *			Small Holdings†	Total Planted Area
	Mature Area ‡	Immature Area	Total Planted Area	Total Planted Area	
Perak ...	273,676	41,018	314,694	274,366	589,060
Selangor ...	303,172	59,845	363,017	145,017	508,034
Negri Sembilan ...	250,631	43,502	294,133	103,965	398,098
Pahang ...	84,754	22,736	107,490	96,777	204,267
Total, F.M.S. ...	912,233	167,101	1,079,334	620,125	1,699,459
Malacca ...	111,874	15,861	127,735	73,571	201,306
Province Wellesley ...	42,200	3,051	45,251	23,824	69,075
Penang Island ...	2,596	370	2,966	15,139	18,105
Singapore Island ...	29,655	903	30,558	21,153	51,711
Labuan ...	—	—	—	1,886	1,886
Total, S.S. ...	186,325	20,185	206,510	135,573	342,083
Johore ...	464,821	94,891	559,712	394,766	954,478
Kedah ¶ ...	196,642	19,105	215,747	108,387	324,134
Perlis ...	1,336	413	1,749	3,646	5,395
Kelantan ...	30,419	3,255	33,674	61,489	95,163
Trengganu ...	14,620	1,505	16,125	28,844	44,969
Brunei ...	6,498	512	7,010	8,298	15,308
Total, U.M.S. ...	714,336	119,681	834,017	605,430	1,439,447
TOTAL, MALAYA ...	1,812,894	306,967	2,119,861	1,361,128	3,480,989

* Estates = 100 acres and over.

† Small Holdings = under 100 acres.

¶ The small holding acreage includes new estates of newly-planted rubber which have not yet been registered for the purpose of these statistics.

‡ Mature Rubber = acreage planted in season 1932-33 or earlier.

Table III.
Area of Budgrafted Rubber in Malaya.

(Estates only)

Territory	1938		1939		1940	
	No. of Areas	Total Acreage	No. of Areas	Total Acreage	No. of Areas	Total Acreage
F.M.S. ...	479	138,140	539	159,654	664	200,395
S.S. ...	57	6,681	64	7,694	90	14,149
U.M.S. ...	197	103,770	234	116,927	301	142,008
Total Malaya	733	248,591	837	284,275	1,055	356,552

Ownership and Constitution of Estates.

Of the total area of rubber on estates, 2,119,861 acres, 74.5 per cent. is European owned, 16.6 per cent. is owned by Chinese, 4.4 per cent. by Indians, and 4.5 per cent. by other nationalities.

At the end of 1940 there were 2,522 rubber estates recorded in Malaya, of which 850 (1,536,080 acres) were owned by public limited liability companies; the remainder, 1,672 (583,781 acres), were the property of private limited liability companies or privately owned.

There were 1,546 estates (316,646 acres) between 100 and 500 acres planted area, 362 estates (260,774 acres) between 500 and 1,000 acres, 560 estates (1,130,185 acres) between 1,000 and 5,000 acres, and 54 estates (412,256 acres) over 5,000 acres.

Labour.

The total labour force employed on estates at the end of 1940 was 351,631, composed of 227,391 men, 98,470 women, and 25,770 children, or 16.6 labourers employed per 100 planted acres of rubber. At the end of 1939 the total estate labour force was 324,193 persons, or 15.4 labourers per 100 acres.

The Rubber Regulation Scheme.

The second International Agreement (1st January 1939 to 31st December 1943) for the regulation of rubber production continued in operation throughout the year. Malaya's basic quota for 1940 was 642,500 tons out of a world quota of 1,541,550 tons. The international releases during the year were: for the first half year 80 per cent., third quarter 85 per cent., fourth quarter 90 per cent., averaging $83\frac{3}{4}$ per cent. for the year as compared with $58\frac{3}{4}$ per cent. for 1939.

Malayan domestic releases were $2\frac{1}{2}$ per cent. below the above international releases during the second and third quarters of 1940.

Under the terms of the current Agreement new planting was permitted until the end of 1940 up to 5 per cent. of the total planted area. Further new planting may be authorized by the International Rubber Regulation Committee up to percentages to be fixed by them. Unconditional replanting was also permitted, subject to approval by the Controller of Rubber, Malaya, but the International Committee reserves the right to review the position and limit replanting after 1940.

The total area newly planted during 1940 was: estates 19,884 acres, small holdings 3,570 acres, total 23,454 acres. The total area replanted was: estates 49,033 acres, small holdings 14,019 acres, total 63,052 acres.

Production, Exports and Stocks.

The production of rubber in Malaya during 1940 totalled 549,327 tons, as compared with 361,484 tons in 1939, and 360,898 tons in 1938. Statistics of production are given in Table IV.

Table IV.
Malayan Production of Rubber.*
(tons).

Territory	Production by Estates of 100 acres and over	Production by Estates of less than 100 acres	Total Production
Federated Malay States ...	177,328	102,986	280,314
Straits Settlements	25,944	15,694	41,638
Unfederated Malay States ...	131,136	96,239	227,375
Total 1940 ...	334,408	214,919	549,327
Total 1939 ...	244,915	116,569	361,484
Total 1938 ...	246,220	114,678	360,898

* Abstracted from the December statement of acreage, stocks, production, imports and exports of rubber, etc., published by the Registrar-General of Statistics, S.S. and F.M.S.

During 1940 the exports of rubber latex and concentrated forms of latex totalled 22,245 tons, or 270 tons less than in 1939. Table V provides statistics of gross exports of latex since 1931. Imports of latex are very small. The quantity of rubber estimated to be contained in this exported latex is included in the statistics of production in Table IV, and also in the total exports shown in Table VII.

Table V.

Gross Exports of Rubber in Concentrated Forms of Latex.

(tons).

Year	Dry Rubber Content of Latex in lbs. per gallon			Total	Value
	Under 4.8 lbs.	4.8 to 5.9 lbs.†	Over 5.9 lbs.†		
					$
1931 ...	—	—	—	1,925	472,123
1932 ...	—	—	—	5,192	1,110,103
1933 ...	—	—	—	10,470	2,871,407
1934 ...	—	—	—	14,172	7,119,548
1935 ...	5,286	5,490	2,374	13,150	6,585,369
1936 ...	6,778	7,073	3,086	16,937	10,673,229
1937 ...	7,122	7,512	4,774	19,408	15,429,910
1938 ...	3,630	4,554	6,747	14,931	8,686,793
1939 ...	5,133	13,936	3,446	22,515	16,451,918
1940 ...	3,384	15,731	3,130	22,245	20,000,002

† Prior to 1939 4.8 to 5.7 lbs. and over 5.7 lbs.

Table VI.

Rubber Stocks in Malaya at end of 1939 and 1940.

(tons).

	1939	1940
Stocks at ports	6,646	12,863
Stocks in hands of dealers	15,548	29,261
Stocks on estates of over 100 acres ...	48,020	33,436
Total ...	70,214	75,560

Stocks held by small-holders are considered to be negligible. Local consumption of rubber by manufacturers of rubber goods, tyres, tubes, belting, shoes, etc. amounted to 1,382 tons, as compared with 511 tons in 1939.

Table VII shows shipments of crude rubber from producing countries since 1931.

Table VII.

Shipments of Crude Rubber from Producing Countries.*

(tons).

Year	Malaya including Brunei & Labuan	Netherlands Indies	Ceylon	Sarawak	Thailand	French Indo-China	Other Sources	Total
1931	423,000	257,000	62,300	10,400	3,600	11,000	32,700	800,000
1932	406,000	211,000	49,300	7,100	3,000	13,500	18,800	708,700
1933	445,800	282,300	63,800	11,100	7,000	17,300	26,100	853,400
1934	467,400	379,400	79,100	17,600	17,700	19,600	38,300	1,019,100
1935	417,000	282,900	54,300	19,300	28,300	28,700	43,200	873,700
1936	353,700	309,600	49,700	21,000	34,600	40,800	48,500	857,900
1937	469,900	431,700	70,400	25,900	35,600	43,400	62,900	1,139,800
1938	372,000	298,100	49,500	17,800	41,600	59,200	56,700	894,900
1939	376,800	372,800	61,000	24,000	41,800	65,200	62,800	1,004,400
1940	540,417	537,733	88,937	35,166	43,940	64,437	81,974	1,392,604

* Compiled from the Statistics Bulletin of the International Rubber Regulation Committee, February, 1941.

Areas out of Tapping.

The area out of tapping on estates at the end of the year was 177,756 acres, or 9.8 per cent. of the estimated acreage of tappable rubber. In addition 211,149 acres (11.7 per cent.) were being rested under rotational systems.

Corresponding figures in 1939 were: out of tapping 347,416 acres (18.7 per cent.), rested 281,051 acres (15.1 per cent.). The substantial reduction in the area out of tapping at the end of 1940 reflects the higher release of 90 per cent. for the fourth quarter and the fact that in December permission was given to use the export credits for the first quarter of 1941, the release for which was 100 per cent. less a domestic cut of $2\frac{1}{2}$ per cent.

On small holdings (estates of less than 100 acres) it was estimated that 201,900 acres, or 16.0 per cent. of the total acreage of tappable rubber, were out of tapping at the end of the year. In Table VIII are summarized the quarterly surveys of small holdings out of tapping since December 1939.

Table VIII.

Percentages of Areas of Tappable Small Holdings out of Tapping.

Territory	Decr. 1939	March 1940	June 1940	Septr. 1940	Decr. 1940
Federated Malay States ...	30.7	33.0	27.6	23.0	21.0
Straits Settlements ...	20.0	22.0	16.6	27.4	18.3
Unfederated Malay States	10.9	17.0	12.7	8.8	9.9
Malaya ...	21.0	25.0	20.2	17.6	16.0

Coagulants.

In the first quarter of the year the Department of Agriculture, in co-operation with the Land Offices, continued the distribution of coagulants commenced towards the end of 1939. With the arrival of adequate supplies of acetic acid, distribution reverted to the licensed dealers and retailers.

In the last quarter of the year a temporary shortage of coagulants was experienced in some localities, and where necessary the Department of Agriculture again undertook the supply of acetic acid.

Considerable attention has been given by the Rubber Research Institute to the question of coagulants both in the direction of examining supplies of mineral acids available and of examining local materials as potential sources of supply of substitute acids.

Legislation was introduced during the year to prohibit the import of hydrochloric and sulphuric acids or the import of coagulants containing these acids except under licence.

Prior to the legislation prohibiting the import of hydrochloric and sulphuric acids taking effect it was found that several brands of coagulants, sold in various parts of the country, contained these acids, and intensive propaganda was carried out by Asiatic Rubber Instructors to encourage small-holders to use only acetic acid.

Conditions on Estates.

Manuring of all ages of rubber trees has continued extensively, although supplies of certain fertilizers from Europe have completely ceased, thereby necessitating the use of substitute fertilizers. In this connexion, calcium cyanamide has been responsible in a number of instances for causing extensive leaf rim scorch and even defoliation.

Locally-produced guanos have been in great demand, and much attention has been given to the use of cattle manure and composts, particularly for planting holes.

Experiments have shown the advantages of steady manuring on most soil types during the early years, and a manuring programme must be considered an essential part of any replanting scheme. A number of cases of excessive bending and even of breaking have been occurring, usually when trees are about $2\frac{1}{2}$ to $3\frac{1}{2}$ years old, which have been attributed to over-manuring. Investigation indicates, however, that the bending is more likely due to a phase of growth during which the stem cannot support the crown development. If the tree is propped or supported during this period it recovers satisfactorily from the tendency to bend, and no permanent or serious damage results.

Strong growths of cover plants in young replanted and new planted areas are essential as a soil protective measure. The heavy competition with the rubber tree, resulting in retarded growth of the rubber, can be reduced by suitable weeding methods. Maintenance of the cover as the rubber trees mature is also essential and in order to ensure this, less drastic weeding is required in young rubber areas as the trees grow older.

Establishment of legumes under mature rubber trees has met with slightly better success. It appears essential to use rooted cuttings, adequate phosphatic fertilizers, and to ensure temporary elimination of rubber root competition by planting in a small hole.

Three areas, totalling 150 acres, were planted up for experimental soils work, the experiments dealing with phosphate manuring, cover crop cultivation and treatment, and manuring with cow dung and compost. Earlier experimental areas continued to be maintained, and growth and development of the rubber trees indicate the advantages of no-burn planting, of manuring with phosphatic fertilizers (for both rubber trees and covers), and of extensive mulching with plant debris on the soil surface during the early months of growth.

The demand for preserved field latex and concentrated latex has fluctuated considerably, although towards the end of the year there appeared to be evidence of an upward trend in the demand by American manufacturers. In spite of difficult conditions prevailing several estates commenced production for the first time and assistance has been given in designing and starting up plants.

Investigations have continued on the questions of the preservation of latex and new methods of concentration both by creaming and centrifuging.

Investigations on the variability of estate sheet rubber have continued and many estates have co-operated with the Rubber Research Institute of Malaya in this work. Particular attention has been directed to the effects of "slaughter tapping" in view of replanting now in progress in Malaya.

The experiments on the modification of rubber in order to impart low water absorption properties have been carried through to the production stage and large-scale samples are now under examination by American consumers. Applications have been made for the protection of processes which have been evolved for the

preparation of softened rubber; the manufacture of this type of material is now being carried out on a commercial scale in Malaya and considerable interest is being evinced in the product in both Europe and America.

Supplies of certain essential materials have been affected by the prevailing conditions. The shortage of plywood cases has given an impetus to other methods of packing rubber, notably as rubber covered bales. Advice, following experimental work, has been given to estates on this method of packing.

Developments have continued to take place in smoke-house design and construction particularly in the direction of enlarging the capacity of Tunnel smoke-houses. A new experimental type of scrap drying shed has also been designed and experimented with.

Continual attention is being directed towards an improvement in the quality of rubber and several new refinements are under investigation with a view to their incorporation in the estate factory.

Conditions on Small Holdings.

As has been seen in Table IV small holding production during 1940 was substantially higher than in the previous year, the actual increase being almost 85 per cent. This increase was primarily due, of course, to the higher restriction releases ruling throughout the year, but undoubtedly the higher prices obtained also encouraged increased tapping. The increase in market price coupled with the higher releases considerably increased the value of coupons, which continued to be treated as a separate commodity. The higher releases were also responsible for a substantial appreciation in the value of uncouponed rubber.

Most of the new planting carried out by small-holders had been completed in 1939, and during 1940 only 3,570 acres were newly planted. In contrast, more interest was shown in replanting, and 14,019 acres were replanted during 1940 as compared with 10,994 acres in 1939.

Considerable propaganda has been necessary to encourage replanting by small-holders and the latter have been adversely influenced by the fear that controlled production might cease and that they would not receive coupons during the period before the trees reached tappable age.

The Small-Holders' Advisory Service, maintained by the Rubber Research Institute, helped considerably in connexion with propaganda aimed at increasing interest in replanting and also by encouraging the use of high-yielding material for both new planting and replanting. The Asiatic Rubber Instructors in this Service continue to work under Agricultural Officers of the Department of Agriculture.

As a result of numerous lectures and constant propaganda interest in budgrafting was extremely satisfactory and large quantities of budwood were supplied by the Department of Agriculture from Agricultural Stations. The Department also obtained supplies from various estates which kindly co-operated.

Demonstrations in budgrafting were given, and in some localities classes in budding were given to Malay youths who were then able to obtain employment budding neighbouring holdings.

Although in certain districts numerous smoke cabinets have been erected, in other parts of the country existing cabinets are not in use, and there is a strong tendency towards producing unsmoked sheet owing to the low premium obtainable for the higher-grade product.

More attention has been paid by small-holders to the adoption of covers in preference to clean-weeding, and seed of approved covers was supplied through the Department. Soil erosion propaganda was maintained with satisfactory results in many districts. In Johore, the construction of bunds or terraces, together with the planting of leguminous creeping covers is enforced on all undulating or hilly land newly alienated for rubber planting.

A considerable trade was developed during the year in Johore in the sale of small-holding rubber in the form of latex. Numerous agencies were opened in various parts of the State for the purchase of latex which was sold to Singapore and also to a local group of estates. Towards the end of the year, however, the sale of latex had virtually ceased except in Johore North.

Pests and Diseases.

Weather conditions were not favourable for the development of leaf mildew, *Oidium Heveae,* and complete refoliation after "wintering" was obtained in central and southern States with only an occasional infection.

The situation regarding Mouldy Rot was little changed during the year. The very dry weather during the first seven months of the year resulted in an almost complete disappearance of the disease from small holdings but later in the year on the advent of rain the disease reappeared in all districts inspected. This enabled further work on testing of fungicides to be carried out, as a result of which two white fluid fungicides have been passed as suitable for control of Mouldy Rot.

A number of cases of Phytophthora disease of the panel were reported as a result of the wet period towards the end of the year. Brown Bast has not required attention during the year.

No change in the situation regarding Pink Disease, stem Ustulina or other branch parasite has been remarked during the year. The occurrence of bark bursts on the stem of certain clones has attracted considerable attention during the year and experiments have been formulated with a view to ameliorating the condition as far as possible in order to prolong the economic life of the affected trees.

Further experiments have been laid down during the year to determine the efficacy of various methods of root disease control in new and replanted rubber areas. Considerable interest has also been shown in the chemical poisoning of rubber trees preparatory to replanting, with a view to reducing the rate of spread of root parasites in the old rubber roots left in the soil.

Considerable attention is being given to the search for parasites of the cockchafer and other grubs.

Acknowledgment.

Acknowledgment is made to the Rubber Research Institute of Malaya for information supplied relating to conditions on estates and to pests and diseases.

QUARTERLY REPORT ON THE MALAYAN PINEAPPLE CANNING INDUSTRY.

March to May, 1941.

Prepared by the Economics Branch of the Department of Agriculture, S.S. & F.M.S., from Reports of Field Officers.

Factories.

The registration of one factory in Johore was cancelled in May, and there are now 19 registered factories in Malaya, four of which are peeling sheds. This total is made up as follows:— Singapore 5, of which one cans juice only; Johore 8 factories and 3 peeling sheds; Selangor 3, of which one is a peeling shed.

The four Singapore pineapple canning factories were in operation at the beginning of the quarter but only one operated throughout the period.

Of the Johore factories three operated throughout the quarter but one on a part time basis only.

None of the Selangor factories worked during the quarter.

Prices.

There was no change in the prices of the canned product as fixed by the Central Board.

It is reported that growers in Johore receive 40 to 50 cents per 100 for fruit in the field not below average size and quality. There is little competition for available supplies, and the market is discriminating. Factories, while observing the prices fixed, reject fruit below average size and any which are not of first quality. It is estimated that 30 per cent. of fruit offered is thus rejected.

Production and Sales.

Exports of Malayan canned pineapples for the two months subsequent to those quoted in the last quarterly report were as follows:— February 1,319 tons, March 1,113 tons.

A quota of 500,254 cases was fixed for the season 1st April to 30th September, 1941, and the whole of this quota was released, subject to the proviso that all packing should cease when unsold stock reached 200,000 cases.

A special Growers' Packing Scheme was introduced and authorized by the Central Board in April. Under this Scheme, growers can arrange with packers to pack up to a total of 250,000 cases without the packing quota of the Board, but any packing arrangement has first to receive the sanction of the Board. No sales of cases packed under this Scheme are to take place until the original 200,000 cases of authorized unsold stock held by the Board have been sold.

Government Research Station and Canning Factory.

Pineapple Jam. — Considerable experimental work has been carried out both at the factory manufacturing jam and at the Canning Research Station. Various combinations of pineapple, with papaya, pumpkin and water melon have been tried and flavourings of fresh lime-juice and ginger root have been added. So far the mixture of pineapple and papaya with lime-juice has been most successful, and it is this jam which has been produced throughout the quarter. Production has been maintained at a maximum with the equipment available, the monthly output reaching 800 cases of 72-1 lb. cans per month. Samples have been tested daily at the Canning Research Station, and a high standard of quality maintained.

Work on the reconstruction of one section of the pineapple factory which is manufacturing pineapple jam is well advanced; two additional new steam-jacketed jam boiling pans were installed and others are expected shortly. The complete new lay-out will comprise two batteries of four pans each with a total monthly output of some 6,000 cases.

Improvements in Locally-Made Cans. — Past experience had shown that the locally hand-made cans were not sufficiently accurate to be closed satisfactorily on a fully automatic double seaming machine; the variations in dimensions, although surprisingly small considering the methods of manufacture, were such that the percentage of faulty seaming was higher than could be tolerated for commercial production. In order to investigate whether cans could be made sufficiently accurately with better equipment, some cast-iron can soldering mandrels were purchased from England. Cans soldered on these and carefully flanged were closed on the fully automatic double seaming machine, and 100 per cent. perfect seams were formed out of a batch of 105 cans seamed at a speed of 80 cans per minute. These small scale tests are extremely promising, and a set of similar mandrels is being made for one of the pineapple factories where they will be tried out on a commercial scale. Should these commercial tests prove as satisfactory as they are now expected to do, it will mean that automatic closing machines can be used satisfactorily with the locally-made cans, thus removing the chief obstacle to the installation of exhausters, namely the handling of hot cans during closing.

Drained Weights of Fruit in Cans. — As a result of a complaint received regarding the underfilling of cans, investigations were carried out and many samples examined. It was found that all samples at the factory in question contained weights of fruit in excess of the minimum usually specified by the trade, but it was noticed that for one or two sizes the cans appeared to be underfilled in spite of conforming to the minimum weight specified. Canning trials were carried out and a new schedule of drained weights was drawn up which is at present under trial. In the meantime the packers have agreed to fill all cans as full as possible in order to avoid any further complaints.

Rubber Compound for Can Sealing. — Two samples of rubber compound for sealing cans were received from a firm in England. These samples were tested and cans closed using them. The compounds were applied very smoothly to the

can ends by the lining machine and satisfactory seams were made. These compounds were considered to be as good as the American-made compounds and their cost is less. Previously, rubber compound for can sealing was obtainable only from America.

Lacquer Trials.—Further samples of British-made lacquers for application to the outsides of pineapple cans were tried out; results confirm that a considerable degree of protection against rusting is afforded by these lacquers. Several thousand cans have been treated and costs of lacquering the various sizes of cans have been worked out.

Pineapple Juice. — Investigations on the production of pineapple juice were continued. The main points under consideration during the quarter were: (a) the improvement in flavour which could be made by careful selection of certain types of fruit and the blending of ripe and unripe fruits, (b) ways and means of reducing the sediment or of keeping it in suspension. Investigations have shown that the flavour can be greatly improved by careful selection and blending of the fruit and have emphasized the importance of rigid control of the fruit used in order to produce commercially a juice of consistent quality. Investigations on dispersing the sediment have so far met with only little success.

Pineapple Crush. — Enquiries were received from England for pineapple pulp preserved with sulphur dioxide. Experiments were consequently carried out and satisfactory results were obtained with sodium bisulphite; this chemical is available in Malaya.

Miscellaneous Work. — Experimental canning trials were continued on vegetables, notably carrots, French beans, potatoes, long beans and tomatoes. Samples submitted to the Naval Authorities were well received and tentative orders have been placed. One firm is ordering the necessary extra equipment for vegetable canning and is reconstructing their factory. Experiments on the production of dried pineapple were only partly successful.

General.

A Marketing Committee was appointed in April to investigate the possibilities of developing potential markets for the pineapple industry.

Following recommendations of the Marketing Committee the Central Board has appointed a local firm to be its sole agents in Malaya for the distribution of pineapple products, and has also decided to adopt a special label for the marketing of its products in Malaya.

Draft regulations to control the manufacture and export of pineapple jam have been prepared by Government.

In Johore it is estimated that 60 per cent. of the crop remains unharvested.

In Singapore there has been a decrease of approximately 200 acres under pineapple cultivation; much of this area is being planted with vegetables.

The crop in Selangor is mainly rotting in the fields, a small proportion being sold as fresh fruit. In some cases food crops are being substituted for pineapple cultivation.

COFFEE MANURIAL AND MULCHINC EXPERIMENTS.

A Correction.

With reference to the article published under the above title on pages 68 to 77 of the February number of the current volume of this Journal it has now been found that the words on lines 10 to 20 of page 74 commencing with "Under these improved physical conditions ....." and ending with "..... an increase of 480 per cent., *i.e.* an extra 72 per cent." were written under an arithmetical misapprehension.

These words should therefore be deleted and the following substituted:

> " The application of a mulch has, however, decreased the efficiency of utilization of the inorganic manures. Reference to Table IV shows that whereas large increases in yield followed the application of inorganic manures to the unmulched bushes, no appreciable response to inorganic manures was obtained on the mulched areas.
>
> A statistical analysis shows that on the unmulched area increases in yield (see Table IV) of 78 per cent. or over are significant at the 20:1 chance. Thus, among the inorganic manures, treatment A (NPK) and treatment C (P) gave increases which are significantly greater than the control. On the mulched area, however, no inorganic manure gave an increase in yield significantly greater than that from the unmanured, mulched bushes."

I am indebted to Mr. W. W. Mayne, B.Sc., Coffee Scientific Officer to the United Planters' Association of Southern India, for pointing out the error in the original article.

A. B. L.

Reviews.

Supplementary Food on Estates.

A Nutritional Survey of the Federated Malay States. III-Supplementary Food on Estates by Dr. Paul Fasal. Bulletin No. 1 of 1941 of the Institute for Medical Research, Federated Malay States. pp. 16.

The nutritional value of red palm oil is stressed in the above publication of the Institute for Medical Research, F.M.S. The author, Dr. P. Fasal, states that a nutritional survey covering 10,000 Tamil and Malay children has shown that sub-nutrition is prevalent among Tamil children on estates. Analysis of their diets shows a lack of protein, fat, Vitamin A, calcium and iron. Communal feeding of the entire estate population is suggested as an ideal solution of this problem. While such an innovation may be impracticable at the present time, it is suggested that under present conditions many parents should be able to provide their children with a much more adequate diet without increased cost. Immediate help for the children is necessary and as a measure that would have immediate effect, the provision of supplementary diets is advocated. A number of estate managements now supply the children of their labourers with supplementary food and many more would be willing to do so if they were convinced that the cost would be reasonably low and good results were to be anticipated.

Recipes for supplementary meals are suggested: in one, rice, dhall, raisins, milk, red palm oil and sugar are used, while a second recommends skim milk powder, powdered sugar and "flavoured" red palm oil. Attention is also directed to soya bean products and suggestions made of the various ways they might be used in the supplementary diets. The possible substitution of soya beans by flour made of copra and groundnut cake and the use of fish meal are also discussed.

The inclusion of red palm oil in the dietary is stressed. Red palm oil has an extremely high Vitamin A (Carotene) value and will play a great part in the dietary of that part of the population among whom Vitamin A deficiency is so frequent. As the Vitamin A value of red palm oil of Malayan origin is not less than 1,000 International Units, the consumption of 5 c.c. would supply the daily requirements. The oil is not yet used on a large scale, mainly because people underestimate its value and properties and the introduction of a new foodstuff in the diet of Tamil labour will always have to encounter intensive conservatism. Technical difficulties also arise, for red palm oil cannot be kept for a long time without becoming rancid; its taste does not appeal to everybody's palate, and long heating destroys a part of the vitamin content. Rancidity can, to a certain extent, be avoided by the use of filtered oil, or by using only the liquid fraction. The result is a relatively higher carotene content. By taking red palm oil with rice and curry, the taste can be masked almost completely, and by using it for frying, a small part of the carotene only will be destroyed.

In some cases of Vitamin A deficiency an intake of Vitamin A alone does not always lead to cure, but if the fat content of the diet is also increased the deficiency is often overcome. The fat of red palm oil used for frying and that present in soya bean cake may thus increase the effect of the Vitamin A.

In conclusion, the author recommends the immediate general introduction of supplementary food rations for children and for pregnant and lactating women on estates as an effective means of improving the state of nutrition.

D. H. G.

The M.A.H.A. Magazine.

The July number of the quarterly magazine of the Malayan Agri-Horticultural Association has just come to hand. By reason of the diversity of subjects of articles the magazine should appeal to a wide range of readers. Mr. R. E. Holttum, Director of Gardens, S.S., Singapore, is editor of the Horticultural Section which includes articles on Rhododendron Seedlings in Singapore, A Garden Planting Key, Flower Arrangement and Plant Hormones. Poultry keepers are given Mr. Mann's article (originally published in *The Malayan Agricultural Journal*) on Seasonal Loss of Condition in Rhode Island Red and Other Fowls in Malaya, while under Miscellaneous Articles is included a thoughtful and instructive article by Mr. J. N. Milsum on "A Modern Malay Holding." Precise information on the economics of the small holding has hitherto been unrecorded; the present article shows that there *are* progressive-minded Malays who make full use of the facilities available for the improvement of their land.

The M.A.H.A. Magazine is deserving of support, and the subscription — $2.50 a year — places this publication within the means of all who take an intelligent interest in the development and welfare of Malaya.

Notes and Comments.

INCREASE OF FOOD CROPS.

Since the outbreak of war much effort and propaganda have been directed to the increase of food crops.

As rice is the most important food of the country it is natural that efforts to increase Malayan production of padi should have received special attention. There has been considerable acceleration of the rate of providing irrigation to new land within the several irrigation schemes under process of development. With a view to effecting better co-ordination between the work of the cultivator and the engineer special terms have been granted to new settlers who are prepared to fell and clear such land within a stipulated period. In established padi areas improvements to irrigation, drainage and bunding have been similarly accelerated and the fixing of a minimum price for padi to be paid by Government rice mills has assisted the cultivator in new and established areas alike. It is certain that all these efforts will result in increased padi production in the near future.

The problem in respect of increased production of other foodstuffs is less simple. A root crop such as tapioca would serve in the case of need as a subsidiary foodstuff to supplement a reduced rice ration, but would not readily be eaten in quantity while rice is available; therefore there would be no market for the produce of large areas if an emergency failed to materialize.

Peasants have, however, responded well to appeals to plant sufficient for their limited personal consumption as is shown by the increase in the area under this crop.

There are similar difficulties in effecting any great increase in the production of market garden vegetables in anticipation of any expected restriction of imports. In the case of such vegetable produce, however, there would be only a short lag between any marked increased demand and increased supply from local production. The increase which has taken place in vegetable production is probably nearly as great as the market can absorb without a fall to unremunerative prices in the absence of any marked further restriction of imports.

FOOD FOR LIVESTOCK.

A limiting factor in cattle keeping in Malaya is the adequate supply of pasture, fodder and feeding-stuffs. In conjunction with the Stock Farm at the Central Experiment Station, Serdang, a number of experiments are in progress towards the provision of nutritious and economic pastures and fodders. The importance of making full use of all possible feeding-stuffs needs no emphasis at the present time. A great many materials, either recognized feeding-stuffs or potential emergency feeding-stuffs have been examined by the Chemical Division during the past year, the results of which will be published in the near future.

Feeding trials with poultry at the School of Agriculture, Malaya, in 1940 dealt mainly with economy mashes designed to meet the shortage of padi and animal proteins due to the war. Rations based on broken rice and vegetable protein such as groundnut cake, copra and green gram gave as good results as could be expected in the circumstances.

MINING SLIMES AND PADI GROWTH.

Two further experiments, one in Perak, the other in Negri Sembilan, confirmed previous experimental observations that the vegetative growth of padi was in no way adversely affected by mining slimes in the irrigation water. In the Perak experiment the slimes had no adverse effect on yield, but in the Negri Sembilan experiment rat damage precluded data being obtained on this point.

CONTROL OF THE BANANA BORER (Cosmopolites sordidus Germ.)

Information has been received that the Hydrophilid *Dactylosternum hydrophiloides* Macl., which was introduced into Jamaica and Australia from Malaya, has become established in Queensland, has spread and appears to be exercising a control over the banana borer, *Cosmopolites sordidus* Germ.

IMPORT OF FOODSTUFFS INTO THE UNITED KINGDOM.

The total quantity of foodstuffs which sea borne or air borne travellers, including seamen and Royal Navy personnel may take unto the United Kingdom as personal effects is 25 lbs. Within this total no one rationed foodstuff may exceed 5 lbs. in weight.

BANANA FLOUR FOR BREAD.

As long ago as 1908 an article was published in this Journal on "Banana Flour and other Flours from Tropical Products, with Notes on Banana Cultivation", followed in 1930 by an article on "The Manufacture of Banana Flour". These two articles advocated a wider use of banana flour for culinary purposes, and gave information on the most suitable varieties for the purpose together with statements of cost of production. Investigations carried out in the Department subsequent to the publication of the article in 1930 showed that the variety Pisang Tandok produces the brightest coloured flour, especially if the central core of the fruit is removed before drying. An attractive appearance is of particular importance in a food product, especially a new one.

A recent issue of *Food Manufacture** draws attention to this subject and quotes from the *Brazil News* of the installation of a plant at Santos where ripe bananas are dried and powdered by a process which does not destroy the cell structure and which conserves the vitamins.

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* Vol. XVI, No. 3, March 1, 1941.

"The flour is put up in tins containing the equivalent of 5 lbs. of mature fruit, one tablespoonful representing one banana. Retention of the vitamin content is important in that banana flour is a useful source of at least one member of the B_2 complex, recent work having revealed a riboflavin content of 0.84 mg. per kilogram of the raw fruit.

"It will be recalled from the wholemeal bread controversy that both vitamin B_1 and B_2 are lacking in white bread. Tinned banana flour may well prove a profitable subsidiary product of the banana plantations and our own West Indian growers are presumably alive to its possibilities. The saving in shipping space is another point in its favour".

In 1940, the net imports into Malaya of wheat were 661 tons, and of wheat flour 59,407 tons, the total value of these two net imports amounting to $5,285,718. There would therefore appear to be a strong case for the further extension of the area under a particular variety of bananas for the manufacture of flour to replace in part this considerable import of wheat and wheat flour.

Departmental.

FROM THE DISTRICTS.

Compiled in the Office of the Chief Field Officer from Monthly Reports of Agricultural Officers.

June, 1941.

The Weather.

In Kelantan, rainfall was up to normal and was well distributed. Elsewhere conditions have been hot and dry and in all parts of the country the rainfall has been much below normal.

Crop Reports.

Rubber.—Prices decreased by $2 to $3 per picul. Supplies of coagulating acid have been short and several reports mention that many licensed dealers have no stocks of acetic acid. Some sulphuric acid is still on sale and this is selling for as much as $1.50 per large bottle. In Johore there is a tendency for small-holders to revert to the use of alum as a coagulant.

In Pahang some small-holders who are replanting have found difficulty in buying budwood. Up to the present, local estates have been able to supply all the budwood of free clones required but none is available just now. Budwood multiplication nurseries have been established at Agricultural Stations in Pahang, as elsewhere, but are not sufficiently advanced to meet the full local demand.

Padi.—The long dry spell has held up padi planting in many areas. Water supplies are short in the Krian Irrigation Area and the level in the reservoir is lower than is usual at this time of year. In many of the smaller irrigation areas water is adequate and cultivation is going ahead.

In the Sabak Bernam area in Selangor vigorous efforts are being made to ensure that the whole of the old area at Panchang Bedena and Sungei Panjang is available for planting this season. In the Tanjong Karang area, Kuala Selangor, clearing is progressing. Arrangements have been made to supply padi seed to cultivators in those areas where the crop failed last season.

In the coastal area of Malacca the land is very dry and no work has yet been possible.

In Johore work is proceeding on clearing Stage I of the new padi area at Padang Endau. Progress has been delayed by the high incidence of malaria among the workers.

Coconuts.—A new factory for the manufacture of coconut oil has been erected at Batu Pahat, Johore, and will shortly be in operation.

The improvement in the yields of coconuts has been maintained in holdings in the Selangor coastal areas affected by the bunds constructed a few years ago. In one such area in Tanjong Karang careful enquiries were made as to past and present yields. The present average is stated to be in the vicinity of 9½ piculs of copra per acre as compared with 6½ piculs before the bund was completed. The improvement is in size as well as in the number of nuts produced.

Pineapples.—Packing at pineapple factories continues on a restricted scale. In June only 5 factories were in operation, 3 in Johore and 2 in Singapore. It is estimated that about 60 per cent. of the crop remained unharvested. Every effort is being made to find fresh markets for canned pineapples to replace those which are closed as a result of the war.

Some factories have been adapted to manufacture pineapple jam which is now being exported to Great Britain in quantity. The possibility of increased production and marketing of Malayan pineapple juice is also under investigation.

Canning of locally-grown vegetables has been undertaken experimentally at the Canning Research Station with satisfactory results. One of the most palatable of these canned vegetables is the long bean. One pineapple factory is making arrangements to undertake vegetable canning.

DEPARTMENTAL NOTES.

Leave.

Mr. T. D. Marsh, Senior Agriculturist, returned from leave on 3rd July 1941.

Mr. F. C. Cooke, Chemist, Industrial Processes, has been granted 175 days leave from 26th June 1941 to 18th December 1941.

Statistical.

MARKET PRICES.

June, 1941.

Rubber.—The Singapore market weakened steadily throughout the month. No. 1. X. Ribbed Smoked Sheet opened at 40¼ cents per lb., and after rising to 40⅜ cents on the 5th June fell steadily to 38½ on the 24th, closing at 38⅝ cents.

The average of daily quotations for the month was 39.43 cents per lb., as compared with 40.80 cents in May. The London average price was 13.58 pence per lb., and New York 21.71 cents gold, as compared with 13.91 pence and 23.76 cents gold in May.

Prices paid for small-holders' rubber at three centres during the month are given in Table I.

Table I.

Weekly Prices Paid by Local Dealers for Small-Holders' Rubber, June, 1941.

(Dollars per picul of 133 1/3 lbs.)

Grades	Kuala Kangsar, Perak.				Kuala Pilah, Negri Sembilan			Batu Pahat, Johore.			
	4	11	18	25	5	12	26	4	11	18	25
Smoked Sheet ...	46.00	43.73	45.95	45.00	47.00	45.85	45.00	—	45.00	45.30	43.53
Unsmoked Sheet ...	45.72	—	42.00	41.97	45.00	—	42.00	43.97	43.20	43.97	42.00
Scrap ...	—	—	—	—	—	—	—	—	—	—	—

Transport by F.M.S.R. lorry service Kuala Pilah to Seremban 12 cents per picul; by rail Seremban to Penang $1.24 per picul, Seremban to Singapore $8 per ton.

Transport from Batu Pahat to Singapore by lorry, excluding duty, 90 cents per picul.

Transport from Kuala Kangsar to Prai by railway $6.20 per ton.

At Kuala Pilah the standard deduction for moisture in unsmoked sheet is 5 per cent.

No purchases at Kuala Pilah on 19th June.

Table II.

Singapore Prices of Various Agricultural Products.

Product	June, 1941			May, 1941	Average Price 1940
	Highest	Lowest	Average	Average	
	per picul $	per picul $	per picul $	per picul $	per picul $
Copra :					
Sundried ...	2.50	2.50	2.50	2.50	3.08
Mixed ...	2.25	2.25	2.25	2.25	2.76
Coconut Oil ...	—	—	8.75‖	7.50	8.29
Copra Cake No. 1 ...	2.35	2.35	2.35	‡	1.43
No. 2 ...	2.00	1.60	1.76	1.60	‡
Pineapples, Canned :*					
G.A.Q. : Cubes ...	4.85	4.85	4.85	4.85	4.85
Sliced ...	4.80	4.80	4.80	4.80	4.80
Tall ...	4.95	4.95	4.95	4.95	4.95
Golden : Cubes ...	5.45	5.45	5.45	5.45	5.45
Sliced ...	5.40	5.40	5.40	5.40	5.40
Tall ...	5.55	5.55	5.55	5.55	5.55
Coffee :					
Liberian ...	17.50	16.50	17.00	16.50	16.10
Excelsa ...	14.50	13.50	14.00	13.50	13.69
Robusta ...	11.50	10.50	11.00	10.25	8.92
Palembang ...	20.00	18.00	18.19 - 20.00	20.10 - 22.30	13.00†
Sourabaya ...	22.00	19.50	19.69 - 21.62	18.30 - 20.30	14.80†
Arecanuts :					
Best ...	10.00	7.00	8.50	6.12	5.65
Medium ...	9.50	6.50	8.00	5.75	5.24
Mixed ...	9.00	5.75	7.19	5.35	4.88
Splits ...	9.25	6.75	6.75 - 8.94	5.55 - 7.52	6.33†
Red Whole ...	16.00	12.50	13.00 - 15.25	15.00 - 17.00	6.67†
Sliced ...	30.00	24.00	24.38 - 28.75	19.95 - 23.10	10.79†
Pepper :					
Singapore Black ...	7.25	7.25	7.25	7.25	7.29
Singapore White ...	14.50	14.00	14.25	14.30	‡
Muntok White ...	15.00	14.87	14.94	14.80	13.51
Nutmegs :					
110's ...	22.00	22.00	22.00	23.00	26.11
80's ...	25.00	25.00	25.00	24.40	30.65
Penang, dried¶ ...	—	—	15.00	15.00	21.00
Mace :					
Siouw ...	‡	‡	‡	‡	‡
Amboina ...	‡	‡	‡	‡	39.85
Penang, dried¶ ...	—	—	37.00	35.00	63.50
Cloves :					
Zanzibar ...	41.00	39.50	39.88	40.00	‡
Amboina ...	42.00	41.00	41.25	41.90	‡
Penang, dried¶ ...	‡	‡	‡	‡	72.00

* per case of 48 cans of 1½ lbs. each. † Highest of the average monthly range quotations.

¶ Penang prices. ‡ Not quoted ‖ In new drums

Product	June, 1941			May, 1941	Average Price 1940
	Highest	Lowest	Average	Average	
	per picul $	per picul $	per picul $	per picul $	per picul $
Gambier :					
Block ...	‡	‡	‡	‡	‡
No. 1 Cube ...	14.50	14.50	14.50	14.50	15.00
Sago :					
Pearl ...	8.62	8.25	8.48	8.77	7.79
Flour, Sarawak Fair ...	4.75	4.40	4.58	5.28	4.95
Tapioca :					
Flake Fair ...	7.25	7.00	7.12	6.50	8.08
Seed Pearl ...	8.25	8.25	8.25	8.25	9.45
Medium Pearl ...	8.00	8.00	8.00	8.00	9.07

Palm Oil.—No recent information is available regarding prices paid in the United Kingdom for Malayan palm oil.

Local sales of palm oil in sellers' drums were made during June at the following prices per ton:— bleached oil 5 per cent. f.f.a., c.i.f. Colombo $205; unbleached oil 5 per cent. f.f.a., f.o.b. Singapore $162.50 and $175.

Rice.—The Singapore average wholesale prices of rice per picul in June were as follows:— Thailand Broken 1st Grade "A" $6.92, Thailand Broken 2nd Grade "A" $6.67, Burma S.Q. Meedone $6.29, Burma Parboiled Milchar No. 2 $5.43. Thailand 3rd Grade "A" and Annam White Rice No. 1 were not quoted.

Padi.— The Government Rice Mills, Perak, are paying a guaranteed price of $2.50 per picul for padi, plus a bonus of 10 cents per picul for pure strain S.K. 48 padi. There were again no purchases of padi at the Government Rice Mill, Temerloh, Pahang.

Retail prices of padi in cents per gantang (gallon) were as follows:— Penang and Province Wellesley 12¾, Perak North 15 to 20, Perak South, Sungei Manik 11 to 12, Teluk Anson 13 to 14, Kinta and Batang Padang 18 to 19; Selangor, coast districts 10 to 12, Kuang 15 to 16; Pahang 15 to 20; Pahang South, Temerloh 17 to 22, Bentong 20 to 22, Johore North 18 to 26; Negri Sembilan 18 to 22; Kuala Pilah 12 to 15, Seremban 22 to 26½; Malacca 15 to 17; Brunei (*kampong*) 18 to 20, (town) 20 to 28; Labuan (*kampong*) 17, (town) 19.

Tea.— There are no London tea sales.

The latest Colombo prices available, quoted from *The Ceylon Tea Market Report* of 24th June 1941 of the Colombo Brokers' Association are as follows, in rupees per lb.: High Grown Rs. 1.26, Medium Grown Rs. 1.16, Low Grown Rs. 1.05.

Cardamoms.— Green cardamoms were quoted in *The Ceylon Chamber of Commerce Weekly Report* of 23rd June 1941 from Rs. 1.95 to Rs. 2.15 per lb.

Derris.—There appears to be an increased demand in the United States, and prices in the American markets have advanced to a considerable extent but local exporters were hesitant to enter into fresh commitments as a result of the difficulty in obtaining shipping space. This had a depressing influence on the local market where prices do not show any appreciable upward tendency and remain slightly above the May quotations. Prices in May per picul were as follows:—$9 to $10.50 for roots sold on a basis of ether extract; $17.50 to $22 for roots with 4 to 5 per cent. rotenone content, rising to $26.50 to $28 for 7 to 9 per cent. rotenone.

Tobacco.—Prices of prepared tobacco per picul in Kelantan were: 1st quality $120 to $150, 2nd quality $100, 3rd quality $80 to $90. Prices of dried leaf per picul were as follows:— Penang and Province Wellesley 1st quality $65, 2nd quality $49; Perak 1st quality $80, 2nd quality $55 to $70, 3rd quality $30 to $55; Perak South $85 to $90, $70 to $80, $50 to $70, prepared tobacco $1.30 to $1.60 per kati, Pahang $55 to $95, $40 to $75, $25 to $50; Pahang South $25 to $40; Selangor, cut tobacco $1.25 to $2.50 per kati, Johore North $35 to $125, prepared tobacco $70 to $150; Negri Sembilan $32 to $35, $25 to $30, $22 to $25; Malacca $80 to $90.

The above prices are based on London and Singapore daily quotations for rubber, on the Singapore daily prices for copra, on the Singapore Chamber of Commerce Weekly Reports for the month and on other local sources of information. Palm oil reports and certain coffee prices are kindly supplied by Guthrie & Co., Ltd., Kuala Lumpur, local palm oil prices by Whittall & Co., Kuala Lumpur, the Singapore prices of imported coffee and arecanuts by Lianqui Trading Company of Singapore, and Singapore derris prices by Hooglandt & Co., Singapore.

1 picul = 133 1/3 lbs. The dollar is fixed at 2s. 4d.

Note. — The Department of Agriculture will be pleased to assist planters in finding a market for agricultural produce. Similar assistance is also offered by the Malayan Information Agency, 57, Trafalgar Square, London, W.C.2.

FERTILIZER PRICES, JULY, 1941.

The following are the prices current for the month of July 1941 of the more important fertilizers of which stocks are available.

	per ton $	
Nitrate of soda	129	
Muriate of potash	200	
Rock phosphate (Christmas Island)	39	($35 Singapore).
Lime	15	

Quotations are *ex* warehouse, Port Swettenham, Klang, Singapore and Penang.

Supplies of sulphate of ammonia, superphosphate, basic slag, calcium cyanamide, sulphate of potash, and rock phosphate (Gafsa) are not available.

MAJOR AND MINOR CROPS.
AREAS (ACRES) CULTIVATED IN MALAYA, 1940

State	Rubber	Other Major Crops	Minor Crops					Total
			Beverages	Food Crops	Fruits	Spices	Miscellaneous	
Perak ...	589,060	245,781	1,808	23,054	37,322	4,378	9,006	910,409
Selangor ...	508,034	141,828	9,408	14,349	9,955	925	5,439	689,938
Negri Sembilan ...	398,098	39,139	920	6,686	6,885	73	926	452,727
Pahang ...	204,267	63,263	6,189	10,302	13,007	2,261	12,132	311,421
Total F.M.S. ...	1,699,459	490,011	18,325	54,391	67,169	7,637	27,503	2,364,495
Singapore Island ...	51,711	9,048	—	5,202	3,315	428	188	69,892
Malacca ...	201,306	44,522	365	5,158	3,721	973	1,767	257,812
Province Wellesley ...	69,075	71,172	—	1,570	916	951	1,735	145,419
Penang ...	18,105	13,294	2	486	2,823	1,478	341	36,529
Labuan ...	1,886	6,896	—	223	1,977	32	21	11,035
Total S.S. ...	342,083	144,932	367	12,639	12,752	3,862	4,052	520,687
Johore ...	954,478	267,985	5,080	21,552	21,857	34,227	7,361	1,312,540
Kedah ...	324,134	296,009	1,464	9,152	12,103	6,810	5,629	655,301
Kelantan ...	95,163	223,046	55	12,126	6,140	6,204	3,072	345,806
Trengganu ...	44,969	74,120	37	3,722	8,277	7,169	2,861	141,155
Perlis ...	5,395	44,586	22	1,354	1,875	2,046	622	55,900
Brunei ...	15,308	8,637	70	2,947	1,582	157	34	28,735
Total U.M.S. ...	1,439,447	914,383	6,728	50,853	51,834	56,613	19,579	2,539,437
Total Malaya 1940 ...	3,480,989	1,549,326	25,420	117,883	131,755	68,112	51,134	5,424,619
Total Malaya 1939* ...	3,422,649	1,510,664	27,632	91,782	112,848	71,053	49,879	5,306,507

* Excluding Southern District, Trengganu, except in the case of rubber and coconuts.

Notes :—*Major Crops*—Padi, coconuts, pineapples, oil palm.

Minor Crops—Beverages :—Coffee, tea.

Food Crops :— Tapioca, sweet potato, sago, sugar cane, groundnuts, vegetables, yams, maize, market gardens, colocasia.

Fruits :—Bananas, specified fruits, mixed fruits, papaya, cashew nuts.

Spices :—Arecanuts, chillies, pepper, cardamoms, ginger, sireh, nutmegs, cloves, turmeric.

Miscellaneous :—Tobacco, derris, nipah, gambier, kapok, cinchona, tung oil, grasses, patchouli, citronella, gutta percha, gingelly, soya beans, ragi, miscellaneous,

MALAYAN AGRICULTURAL EXPORTS, APRIL, 1941.

Product	Net Exports in Tons				
	Year 1940	Jan./April 1940	Jan./April 1941	April 1940	April 1941
Arecanuts ...	43,915	15,436	16,665	3,548	1,522
Coconuts fresh†‡ ...	131,469†	27,160†	73,116†	7,357†	12,829†
Coconut oil‡ ..	69,446	21,714	27,335	5,955	6,571
Copra‡ ...	9,904*	1,468	15,553*	5,840	4,451*
Copra cake ...	1,215*	4,301	5,823*	1,147	115
Gambier, all kinds ...	821	256	30	57*	13
Palm kernels ...	9,219	3,369	1,700	1,263	—
Palm oil ...	55,990	14,817	14,526	2,811	4,210
Pineapples, canned ...	40,243	16,903	5,585	4,252	1,298
Rubber¶ ...	549,327¶	174,889¶	193,686¶	49,418¶	56,877¶
Sago,—flour ...	2,525	892	555*	646	1,393*
,, —pearl ...	4,848	1,215	2,363	281	689
,, —raw ...	4,816*	2,193*	1,144*	729*	271*
Tapioca,—flake ...	762	341	216	66	112
,, —flour ...	2,649*	524*	460*	114*	250*
,, —pearl ...	17,004	4,567	6,607	1,620	1,652
Derris ...	1,258	485	312	115	54
‡Copra equivalent ...	108,468	37,296	31,467	15,664	6,757

† hundreds in number. * net imports. ¶ production.

MALAYAN PRODUCTION OF PALM OIL AND KERNELS

(In long tons, as declared by Estates).

Month 1941	Palm Oil			Palm Kernels		
	F.M.S.	U.M.S.	Malaya	F.M.S.	U.M.S.	Malaya
January	1,872.7	1,221.4	3,094.1	170.3	150.0	320.3
February	1,698.3	993.2	2,691.5	167.1	179.3	346.4
March	2,179.8	1,710.1	3,889.9	180.5	274.9	455.4
April	1,993.0	1,870.8	3,863.8	176.3	204.0	380.3
May	1,878.0	2,022.3	3,900.3	95.2	219.0	314.2
Total	9,621.8	7,817.8	17,439.6	789.4	1,027.2	1,816.6
Total January to May 1940 ...	10,255.6	10,140.5	20,396.1	2,126.0	2,110.1	4,236.1
Total for the year 1940	29,875.2	28,096.9	57,972.1	4,513.1	5,098.1	9,611.2

Stocks on estates as at 31st May, 1941 were: palm oil 3,347 tons, palm kernels 1,656 tons.

ACREAGES OF TAPPABLE RUBBER ACTUALLY TAPPED AND NOT TAPPED ON ESTATES OF 100 ACRES AND OVER, FOR THE MONTH ENDING 31ST MAY, 1941.

STATE OR TERRITORY	Estimated Acreages of Tappable Rubber (9) + (11)	ACREAGES OF TAPPABLE RUBBER NOT TAPPED				Area of tappable rubber never been tapped (b)		Total area not tapped (3) + (5) (c)		TOTAL AREA TAPPED DURING THE MONTH		Area of tappable rubber rested under rotational systems (c)	
		On estates which have entirely ceased tapping		On estates which have partly ceased tapping (a)									
		Acreage	Percentage of (3) to (2)	Acreage	Percentage of (5) to (2)	Acreage	Percentage of (7) to (2)	Acreage	Percentage of (9) to(2)	Acreage	Percentage of (11)to(2)	Acreage	Percentage of (13) to(2)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
S.S.—													
Province Wellesley ...	42,060	nil	nil	5,123	12.2	288	0.7	5,123	12.2	36,937	87.8	7,713	18.3
Malacca ...	109,272	241	0.2	7,379	6.8	673	0.6	7,620	7.0	101,652	93.0	16,310	14.9
Penang ...	2,596	nil	nil	576	22.2	35	1.3	576	22.2	2,020	77.8	60	2.3
Singapore ...	28,879	1,394	4.8	5,175	17.9	304	1.1	6,569	22.7	22,310	77.3	1,806	6.3
Total S.S. ...	182,807	1,635	0.9	18,253	10.0	1,300	0.7	19,888	10.9	162,919	89.1	25,889	14.2
F.M.S.—													
Perak ...	272,498	392	0.2	13,648	5.0	2,363	0.9	14,040	5.2	258,458	94.8	30,344	11.1
Selangor ...	299,504	986	0.3	12,312	4.1	2,064	0.7	13,298	4.4	286,206	95.6	31,289	10.4
Negri Sembilan ...	244,832	2,035	0.8	19,037	7.8	3,930	1.6	21,072	8.6	223,760	91.4	20,513	8.4
Pahang ...	84,442	688	0.8	7,338	8.7	2,058	2.4	8,026	9.5	76,416	90.5	3,298	3.9
Total F.M.S. ...	901,276	4,101	0.5	52,335	5.8	10,415	1.2	56,436	6.3	844,840	93.7	85,444	9.5
U.M.S.—													
Johore ...	466,176	5,581	1.2	35,658	7.6	17,109	3.7	41,239	8.8	424,937	91.2	48,212	10.3
Kedah ...	188,043	4,380	2.4	7,582	4.0	3,894	2.1	11,962	6.4	176,081	93.6	22,198	11.8
Kelantan ...	30,596	403	1.3	4,452	14.6	971	3.2	4,855	15.9	25,741	84.1	2,007	6.6
Trengganu (d) ...	4,817	nil	nil	nil	nil	nil	nil	nil	nil	4,817	100.0	1,661	34.5
Perlis (e) ...	1,336	nil	nil	326	24.4	90	6.7	326	24.4	1,010	75.6	167	12.5
Brunei ...	6,142	nil	nil	1,017	16.6	280	4.6	1,017	16.6	5,125	83.4	730	11.9
Total U.M.S. ...	697,110	10,364	1.5	49,035	7.0	22,344	3.2	59,399	8.5	637,711	91.5	74,975	10.8
Total MALAYA ...	1,781,193	16,100	0.9	119,623	6.7	34,059	1.9	135,723	7.6	1,645,470	92.4	186,308	10.5

Notes.—(*a*) Area out-of-tapping on estates which have partly ceased tapping refers to areas definitely being rested and excludes areas on any tapping round.

(*b*) The acreage shown in column (7) is included in columns (3) and (5).

(*c*) Areas of tappable rubber rested under rotational systems are not considered as out-of-tapping and therefore (11) and (12) include columns (13) and (14) respectively.

(*d*) Registered companies only.

MALAYAN RUBBER STATISTICS Table I.

ACREAGE, STOCKS, PRODUCTION, IMPORTS AND EXPORTS OF RUBBER, INCLUDING LATEX, CONCENTRATED LATEX AND REVERTEX, FOR THE MONTH OF MAY, 1941, IN DRY TONS.

State or Territory	Stocks at beginning of month 1			Production by Estates of 100 acres and over		Production by Estates of less than 100 acres estimated 2		Imports				Exports including re-exports				Stocks at end of month			Consumption 3	
								during the month		January to May 1941		during the month		January to May 1941						
	Ports	Dealers	Estates of 100 acres and over	during the month	Jan. to May 1941	during the month	Jan. to May 1941	Foreign	From Malay States	Foreign	From Malay States	Foreign	Local	Foreign	Local	Ports	Dealers	Estates of 100 acres and over	during the month	Jan. to May 1941
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
MALAY STATES :—																				
Federated Malay States ...	...	10,856	18,176	14,862	76,696	5,630	40,986	Nil	Nil	Nil	Nil	13,205	12,451	65,394	54,203	...	7,589	16,153	126	697
Johore ...	...	3,228	6,272	7,668	37,068	5,177	27,986	Nil	11	Nil	42	3,112	9,929	14,013	50,940	...	3,124	6,191	...	...
Kedah ...	...	810	4,061	3,917	18,927	1,454	7,795	Nil	Nil	Nil	Nil	1,112	4,393	6,455	20,583	...	691	4,046	...	...
Perlis ...	..	37	27	28	105	36	157	Nil	Nil	Nil	Nil	Nil	60	Nil	260	...	37	31	...	...
Kelantan ...	...	415	550	428	2,230	549	3,135	Nil	Nil	Nil	Nil	289	690	914	4,211	...	461	502	...	...
Trengganu ...	...	139	118	192	1,015	311	1,963	Nil	Nil	Nil	Nil	Nil	529	15	2,894	...	96	135	...	...
Brunei ...	...	9	50	70	314	113	525	...	...	...	...	...	167	...	808	...	17	58	...	...
Total Malay States	...	15,494	29,254	27,165	136,355	13,270	82,547	Nil	11	Nil	42	17,718	28,219	86,791	133,899	...	12,015	27,116	126	697
S. SETTLEMENTS :—																				
Malacca ...	...	2,686	1,754	1,556	7,857	887	4,521	Nil		Nil		3,162		15,361		...	1,976	1,570	...	...
Province Wellesley ...	...	3,015	717	634	2,969	268	1,281	Nil		Nil		12,375		55,082		...	2,792	746	...	...
Penang ...	3,989	5,276	16	27	120	113	525	914	29,691	7,842	131,552		Nil		Nil	3,087	5,468	18	...	...
Singapore ...	10,279	22,541	240	200	948	154	775	20,774		105,911		41,392		171,868		13,774	22,281	257	30	134
Labuan ...	...	61	Nil	Nil	Nil	16	78	63		315		Nil		Nil		...	21	Nil	...	...
Total Straits Settlements ...	14,268	33,579	2,727	2,417	11,894	1,438	7,180	21,751	29,691	114,068	131,552	56,929	Nil	242,311	Nil	16,861	32,538	2,591	30	134
Total Malaya ...	14,268	49,073	31,981	29,582	148,249	14,708	89,727	21,751	29,702	114,068	131,594	74,647	28,219	329,102	133,899	16,861	44,553	29,707	156	831

TABLE II
DEALERS' STOCKS, IN DRY TONS 3

Class of Rubber	Federated Malay States	S'pore	Penang	P.We'sly M'cca. Labuan & Brunei	Johore	Kedah
22	23	24	25	26	27	28
DRY RUBBER	6,322	21,425	5,215	4,551	2,456	334
WET RUBBER	1,267	856	253	255	668	357
TOTAL ...	7,589	22,281	5,468	4,806	3,124	691

TABLE III
FOREIGN EXPORTS

PORTS	For month	Jan. to May 1941
29	30	31
Singapore ...	52,654	228,553
Penang ...	15,289	68,863
Port Swettenham.	6,704	31,464
Malacca ...	Nil	222
TOTAL ...	74,647	329,102

TABLE IV
DOMESTIC EXPORTS 4

AREA	For month	Jan. to May 1941
32	33	34
Malay States ...	45,906	220,361
Straits Settlements	4,204	19,171
MALAYA ...	50,110	239,532

Notes:—
1. Stock on estates of less than 100 acres and stocks in transit on rail, road or local steamer are not ascertained.
2. The production of estates of less than 100 acres is estimated from the formula: Produc ion + imports + Stocks at beginning of month = Exports + Stock at end of month, + Consumption, *i.e.*, Column (7) = Columns [13] + [14] + [17] + [18] + [19] + [20] − [2] − [3] − [4] − [5] − [9] − [10]. For the Straits Settlements the production of estates of less than 100 acres is represented by sales or exports as shown by cess paid.
3. Dealers' stocks in the Federated Malay States are reduced to dry weights by the following fixed ratios: unsmoked sheet, 15% wet sheet, 25% scrap, lump, etc., 40%: stock elsewhere are in dry weights as reported by the dealers themselves.
4. Columns (33) and (34) represent exports of rubber subject to regulation which for Singapore and Penang Islands are represented by sales or exports as shown by cess paid.
5. All statements are brought up to date monthly, and any inaccuracies that may be disclosed are corrected in the totals; the latest publication therefore, is always the most reliable.
6. The above, with certain omissions, is the Report published by the Registrar-General of Statistics. S.S. and F.M.S., at Singapore on 25th June, 1941.

METEOROLOGICAL SUMMARY, MALAYA, MAY, 1941.

Locality.	Air Temperature in degrees Fahrenheit							Earth Temperature		Rainfall								Bright Sunshine.		
	Means of			Absolute Extremes								Most in a day.	Number of days.							
	A. Max.	B. Min.	Mean of A and B	Highest Max.	Lowest Min.	Lowest Max.	Highest Min.	At 1 foot	At 4 feet	Total.		Amt.	Precipitation .01 in or more	Precipitation .04 in or more	Thunderstorm	Fog morning obs.	Gale force 8 or more	Total.	Daily Mean.	Per cent.
	°F	°F	°F	°F	°F	°F	°F	°F	°F	in.	mm.	in.						hrs.	hrs.	
Kuala Lumpur Aerodrome, Selangor ...	92.6	75.4	84.0	†	†	†	†	86.9	87.7	11.12	282.4	†	13	12	12	—	—	198.90	6.42	52
Port Swettenham Aerodrome, Selangor ...	91.0	74.7	82.9					88.0	87.4	6.49	164.8		15	15	2	—	—	205.75	6.14	54
Sitiawan, Perak ...	90.8	76.2	83.5					86.2	86.6	5.35	135.9		17	13	2	—	—	205.55	6.63	54
Ipoh Aerodrome, Perak ...	92.4	75.4	83.9					85.7	86.1	8.60	218.4		16	13	2	1	1	207.35	6.69	55
Temerloh, Pahang ...	92.9	75.1	84.0					88.6	89.0	2.49	63.2		12	12	4	8	—	206.05	6.65	54
Kuala Lipis, Pahang ...	91.3	74.4	82.9					86.0	86.9	10.52	267.2		17	11	3	28	—	201.50	6.50	53
Kuala Pahang, Pahang ...	89.6	76.5	83.1					90.5	90.3	1.97	50.0		11	7	—	—	1	206.35	6.66	54
Kallang Aerodrome, S'pore ...	87.8	78.3	83.1					84.5	85.4	6.94	176.3		16	12	1	—	—	151.55	4.89	40
Bayan Lepas Aerodrome Penang ...	89.6	77.1	83.3					87.3	87.0	3.16	80.3		10	8	1	—	—	210.50	6.79	55
Malacca Town, Malacca ...	88.2	76.0	82.1					86.1	87.1	7.60	193.0		14	14	4	—	2	226.10	7.29	60
Kluang, Johore ...	90.2	73.9	82.1					83.3	84.3	9.92	252.0		20	17	6	11	—	160.05	5.16	42
Mersing, Johore ...	89.3	74.9	82.1					85.9	85.7	3.51	89.2		15	15	1	—	1	182.30	5.88	48
Alor Star, Kedah ...	91.1	76.3	83.7					87.9	88.1	10.14	257.6		18	14	10	3	—	224.55	7.24	58
Kota Bahru, Kelantan ...	92.1	76.0	84.1					87.0	86.5	1.70	43.2		7	4	1	—	—	222.80	7.19	58
Kuala Trengganu, Trengganu	90.8	75.4	83.1					88.1	88.1	2.74	69.6		10	9	—	—	—	240.25	7.75	63
Labuan ...	89.5	78.7	84.1					87.7	89.2	18.20	462.3		21	20	3	—	2	255.65	8.25	67
HILL STATIONS.																				
Fraser's Hill, Pahang, 4268 ft.	76.5	65.1	70.8					74.9	74.7	7.59	192.8		19	16	4	9	1	171.20	5.52	45
Cameron Highlands, Tanah Rata, Pahang 4750 ft. ...	75.5	59.7	67.6					73.3	71.8	10.47	265.9		20	18	—	—	—	148.55	4.79	39
Cameron Highlands, Rhododendron Hill, Pahang 5120 ft. ...	75.1	62.8	68.9					*	*	11.49	291.8		20	19	—	—	—	174.45	5.63	46

* Not recorded.

† Restrictions have been placed on the supply of certain types of Meteorological information